

P.D

Layout of Dam
No. 4

FIELD BOOK

3615

W123

4

KEUFFEL & ESSER CO.

DRAWING MATERIALS

AND

MICROFILMED SURVEYING INSTRUMENTS.
NEW YORK.

CHICAGO. ST. LOUIS. SAN FRANCISCO. MONTREAL.

Tables for Excavations and Embankments.

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.
ROADWAY 18 FEET WIDE. SIDE SLOPES 1 TO 1.
FOR SINGLE TRACK EXCAVATION.

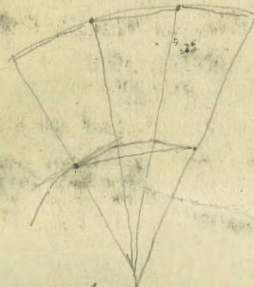
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	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	0
1	10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9	1
2	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	2
3	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	3
4	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	4
5	14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	5
6	15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9	6
7	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	7
8	17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	8
9	18.0	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9	9
10	19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	19.8	19.9	10
11	20.0	20.1	20.2	20.3	20.4	20.5	20.6	20.7	20.8	20.9	11
12	21.0	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9	12
13	22.0	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9	13
14	23.0	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9	14
15	24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9	15
16	25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9	16
17	26.0	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9	17
18	27.0	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9	18
19	28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	19
20	29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	20
21	30.0	30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	30.9	21
22	31.0	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9	22
23	32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9	23
24	33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9	24
25	34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9	25
26	35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9	26
27	36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9	27
28	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9	28
29	38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9	29
30	39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	30
31	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	31
32	41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	32
33	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	33
34	43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9	34
35	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9	35
36	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	36

Calculated by Julien A. Hall, M. Am. Soc. C. E.

FOR KEITH'S RAILROAD CURVE TABLES SEE END OF BOOK

2591



Chan Sect -

26 line

28 line

67

2592

B = 55.79 from C. 22.79
 A = 67.19 " B. 26.15

43° 50'
 90
 22 55
 67 5

93 - 28° 41'

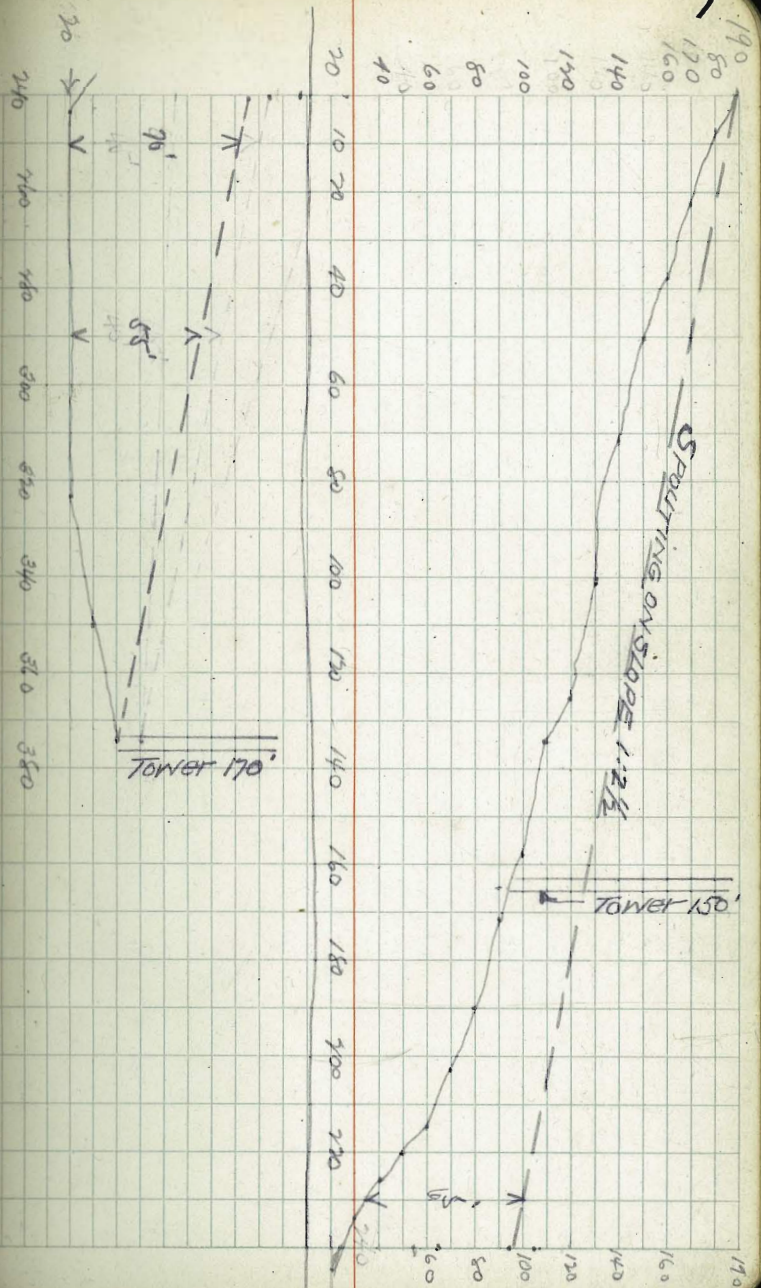
43428
 160.14
 37415

43428
 160.14
 274.14

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Elev for Upstream face of Dam.	40
Elev + dist out for Markers D + Ustream face	41
Coordinate point c	42

Spouting System





A ledger page with a grid of 20 columns and 25 rows. A vertical red margin line is positioned on the left side of the grid, approximately one-fifth of the way across the page. The grid is composed of thin blue lines.

Functions 400' R Curve

$\Delta = 45^\circ 50' 11.5''$

$R = 400''$

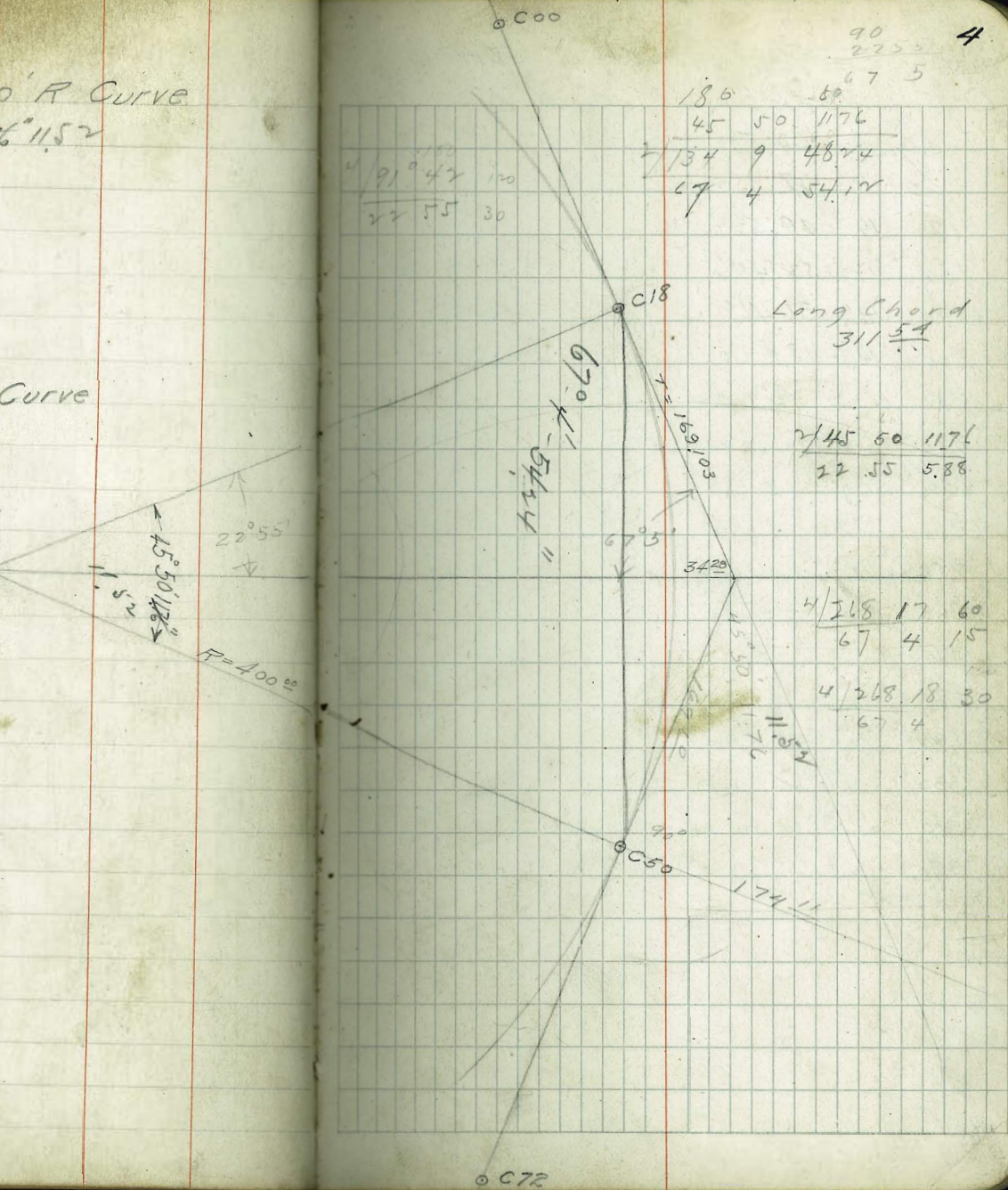
$T = 169.103'$

$L = 320''$

$E = 34.88$

Deflections for 400' Curve

Chord	Deflection	Central Δ
1	0°-4.297	0°-8.594
5	0°-21.486	0°-44.971
10	0°-44.971	1°-25.944
20	1°-25.944	
30	2°-08.916	
40	2°-51.888	
50	3°-34.860	
60	4°-17.832	
70	5°-00.804	
80	5°-43.776	
90	6°-26.748	
100	7°-09.720	
110	7°-52.692	
120	8°-35.664	
130	9°-18.636	
140	10°-01.608	



90
22.55
67.5
180
45 50 11.76
2/134 9 48.74
67 4 54.12

Long Chord
311.54

2/145 50 11.76
22.55 5.88

4/268 17 60
67 4 15

4/268.18 30
67 4

C72

Deflections 400 R Curve
 Dist Deflection Central Δ

150	10° 44' 58"
160	11° 27' 55" ✓
170	14° - 10' 52"
180	17° - 53' 49"
190	13° - 36' 46"
200	14° - 19' 44"
210	15° - 02' - 24"
220	15° - 45' - 23"
230	16° - 28' 21"
240	17° - 11' 19"
250	17° - 54' - 18"
260	18° - 37' - 16"
270	19° - 20' - 14"
280	20° - 03' - 12"
290	20° - 46' - 10"
300	21° - 29' - 09"
310	22° - 12' - 07"
320	22° - 55' - 05.76"

Set up on PI

Central L. $45^{\circ} 50' 12''$

$\frac{1}{2}$ $22^{\circ} 55' 6''$

$90 - \frac{1}{2}\Delta$ $67^{\circ} 4' 54''$

Slope Dist 181.04

Vert L $23^{\circ} 9'$

cos 91948

18104

367792

91948

735584

91948

16646266

To. Tang.

16910.3

16646

264

L to E $51^{\circ} 36'$ from $\$34$

10%

Slope = 182.84

$23^{\circ} 12\frac{1}{2}'$ cos

91908

18284

367632

735264

183816

735264

91908

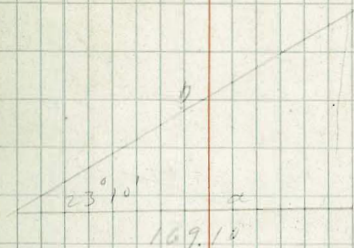
1680445

16910

1.06

16910

6



169.10

$$\cos = \frac{a}{b}$$

$$b = \frac{a}{\cos}$$

$$\begin{array}{r} 20 \\ 22.5 - 2.6 \\ \hline 19.9 \end{array}$$

Cement House.

180210
144612

364¹⁰ 29.94

162633

NW Cor	237
N 2	1023
SW Cor	535
S 2	1189

Grade bottom sills

= 1623

= 6.94 G.R.

Changed grade to 4 FT lower

5

Set Reference

Points as follows

18-303	12.437
4-455	10.442
4-330	B-18
0-330	B-16
0-429	B-14
On Tangent 0-28	4-350
	B-20
6-315	B-22
6-480	B-24
8-450	24-321 ²
8-315	22-324 ^{221 32}
10-315	20-312
12-315	16-309

188
3212

100

344

34
165
45579
16013
295.64

7

14-319	
26-366	
27-357	
34- 295.64	274.14 ✓
34-440.16	118.66 ✓
34-50.16	28.66

Oct 27

Triangulation
on Curve Points

AT PC-C18

PI $23^{\circ}-56'$
 to $45-50-30$
 P.T.-C50 $4 \overline{91^{\circ}-21-30}$
 $22 \quad 55 \quad 22.5$

$22^{\circ}-55'$ $22^{\circ} 55' 11''$
 $4 \overline{91^{\circ}-40}$
 $22 \quad 55$

(P.I.)
 C50 P.I. AT PC-C18

to $14 \overline{54^{\circ} 5'}$ $6 \overline{324^{\circ} 30'}$
 $34-274$ $54^{\circ} 5'$ $54^{\circ} 5'$

AT PI

C50
 to $67^{\circ} 4\frac{1}{2}'$
 $34-274$ $6 \overline{402^{\circ} 28'}$
 $67^{\circ} 4\frac{1}{2}'$

AT P.I.

PC-C18 $67^{\circ} 5'-30''$
 to $6 \overline{402-31'-30''}$
 $34-274$ $67-5' 15''$

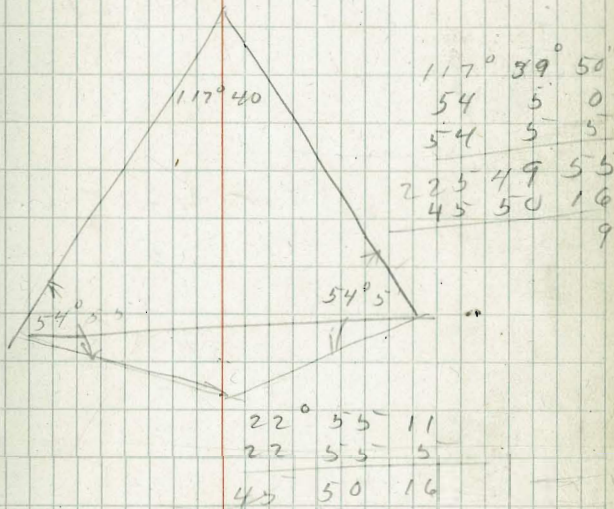
9913

29564

89

8

68
 199213
 16013
 5379
 $\hline 1592$
 10434



Triangulation
 Curved Points
 At C50

34-274^{1/2}

54° 5'

to
 P.I.

u | 324° 30' 30'
 54 5 5'

At C50

C18

22° 55 1/2'

to

P.I.

6 | 137° 33' 0.5"
 22 55' 55"

134 9 45"
 22 55 11"
 22 55 5"
 179 159 61

C18

At 34-274^{1/2}

to

C50

117° 40'

u | 705 239 300
 59
 117° 39' 30"
 54° 5' 5"
 54° 5' 0"
 134° 9' 45"

117° 39' 50"
 54° 5' 0"
 54° 5' 5"
 67° 4' 30"
 67° 5' 15"
 359 58 100

Fixer Oct 28/1919
Ketchum
Johnson.

A 7 B-50

Sight C-50 for 0-00

Turn 90°

Set B 52 - B 54

B-52 1° 26'

B 54 2 52

Sight C 50 for 0-0

Turn 90° for 270°

Set B 48

B 48 1° 26'

20

B 46 2° 52'

40

B 44 4° 18'

60

B 42 5° 44'

Set or B-34

B-36 20'

1° 26'

B 38 40

2° 52'

B 40 60

4° 18'

B 42 80

5° 44'

B 44 100

7° 10'

120

8° 36'

140

10.02

160

11° 28'

68.19

19

Oct 29 19
Fisher
Ketchum
Bub

At C 50 turn to center
of curve set Nail in oak stamp
22864 dist = 50-R.171.36

Set ~~hub~~ on 50-R.171.36 read
slope angle of 15° 56' chain
100' on slope = 96.15' + horizontal
chain of 1880 = 114.95 total dist
from 50-R.171.36 set hub =
50-R.5641

Center of curve checks
abt .98' beyond 408 right.

Fisher
Ketchum
Johnson

300' Radius

Set on 50-300-sight & 90°-turn

90°	For 0-0	Dist between Points 15'0"
78	15	1°26' ✓
76	30	2°52' ✓
74	45	4°18' ✓
72	60	5°44' ✓
70	75	7°10' ✓
68	90	8°36' ✓
66	105	10°02' ✓
64	120	11°28' ✓
62	135	12°53' ✓

67° 4-30

Fisher
Bugs
Johnson
Ketchum.

11/19/19

At C-70 - Sight C-50 for 0-0
Turn 90° - Set Hub -
75' + 125' South of C-line -

At C-60 - Sight C-50 for 0-00
Turn 90° left - Set Hubs
at 75' - 100 - 125 + 150'

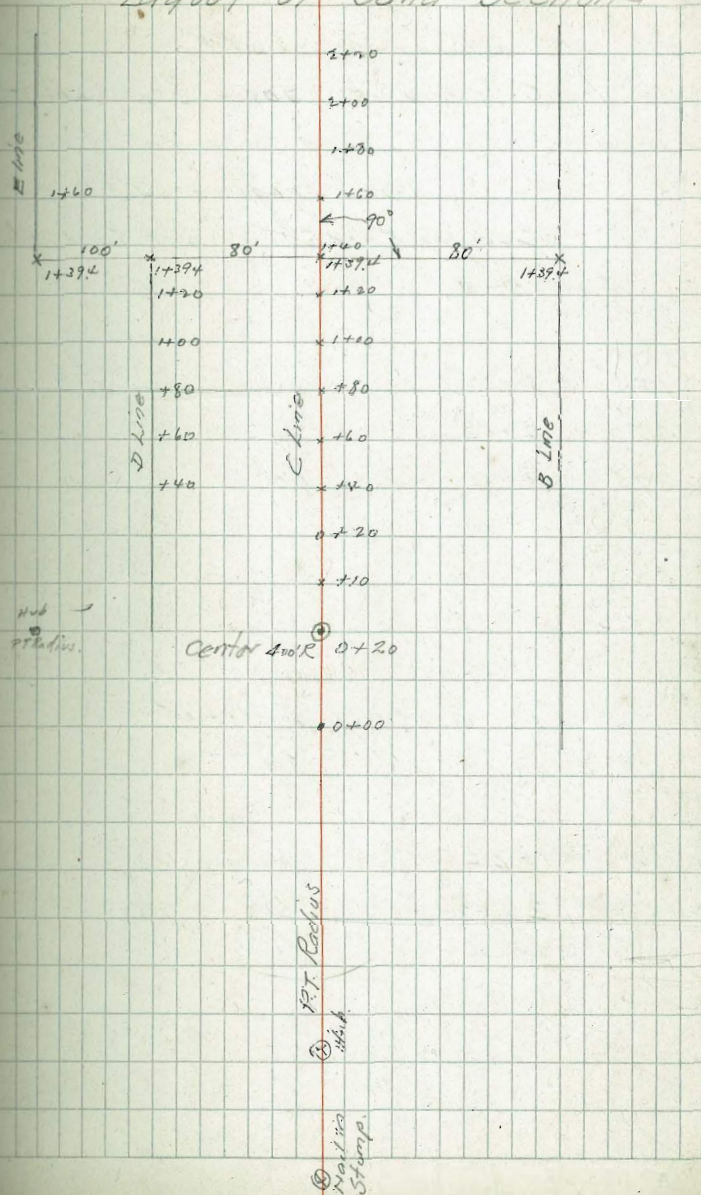
Set on 60-325 - Sight
70-325 - + Place points
every 20' between stations.

Set on 60-275 - Sight 70-
275 + Place points every 20'
between stations -

Set on 60-300 Sight
50-300 + place points -
Every 20' between points.

12

Layout of Sand Sections



20170
Fisher
Hub

Coord. Point on 250' Radius

13

Occupy 50-300 - Sight 50-171²⁶
for 0-0 chain 50' from 50-300 = 50-250'
Cord Length - 12.50'

Occupy 50-250 - Sight 50-171²⁶
for 0-0

45-250		
12.5	1°-26'	Hub
46-250		
25.0	2°-52'	Hub
44-250		
37.5	4°-18'	Hub
42-250		
50	5°-44'	
40-250		
62.5	7°-10'	
38-250		
75.0	7°-53'	

Occupy 44-250 Sight
50-250 for 4°-18'

42-250	1-26	Hub
40-250	2-52	FOR
	4°-18	

40-250 0.56

Sand Storage

Original Ground Sections

Left

0+00

0+20 = center of floor Curve.

Levels

RP 34-274 th	1387	1480.92	1467.05
Top Wier Wall		1351	1467.41
TP Rock 2'E of Track	220	78.72	
TP Rock below Track	215	67.69	1538 65.54
TP Rock	312	1456.17	1464 53.05

A Line

00	59	50.3
+20	6.2	50.0
+40	7.0	49.2
+60	7.0	49.2
+80 Hub	715	4902

Q

Right

G Line

1456.17

2+40 P&R	350	52.67
2+20	8.6	47.6
2+00	7.6	48.6
1+80	6.6	49.6
Top 1+20	14.81	69.56
1+60	2.00	49.6
+62	1.98	49.9
+47 P&R	8.0	61.6
+40 P&R	7.2	62.4
+275 P&R	7.3	62.3
+23	15.6	54.0
1+20	15.4	54.2
1+00	12.4	57.2
+80	9.9	59.7
+60	6.2	63.4
+40	3.5	66.1
+30	2.3	67.3
TP Rock 0+27	14.48	84.04
0+20 ①	8.16	75.88
00	+2.9	86.9
TP Rock	5.33	78.71 ✓

1/29/20
Sub
Fisher
Howard.

Levels Sand Section
Cont.

D LINE

675 476.31 1469.56

0+40		+13.1	894
0+60	71	+2.1	784
0+80	59	5.2	711
1+00	59	5.8	705
1+20		6.3	700
1+39.4		7.4	689
1+39.4	E line.	7.4	689
1+60		10.5	658
1+80		13.0	633
2+00		14.6	617
TP Stamp	0.40	61.30	1541
2+20		6.4	549
2+40		14.0	473
2+60		13.3	480
2+80		13.1	48.2
3+00 P.O.R.		10.8	505
3+20 P.O.R.		52.1	56.09

15

Levels B Line

Top 1+20 Close	882	63.57	5475
B 1+00		11.8	51.8
1+20		11.2	52.4
1+39.4		9.8	53.8
1+60		8.3	55.3
1+80		6.8	56.8
2+00		1.2	62.4

1/29/28

Sections Sand Storage

00 line

C00	2.4	89.3	86.9 ✓
22L		1.0	88.3 ✓
25R		2.7	81.6 ✓
34R		16.5	72.8 ✓
48R Top Rail		13.1	76.2 ✓
53 to Far Rail			

0+20-32L		9.0	80.3 ✓
0+20-10L		18.2	71.1 ✓
60+20		13.5	75.8 ✓
0+20-11R		11.3	78.0 ✓
" - 28R		15.0	74.3 ✓

TP Rock	5.5	71.04	65.54
00-68R		2.0	69.0 ✓
" - 73R		8.2	62.8 ✓
" - 81R		8.5	62.5 ✓
" - 85R Edge Sand Bottom		18.5	52.5 ✓
00-A-100R		20.7	50.3 ✓
" 130R Edge Sand Bottom		21.7	49.3 ✓
" 135R			65.3 ✓
" 138R			71.0 ✓

Platted 2-2-20

16

1/29/20

Original Ground Sand Sections

17

7104

Platted 2-2-20

0+20-72R		6.2	64.8 ✓
" 74R		14.6	56.4 ✓
" 79R		13.5	57.5 ✓
" 83R Edge Sand Bottom		19.8	51.2 ✓
" 100 = A+20.		21.0	50.0 ✓
" 127R E. Sand B.		21.9	49.1 ✓
" 130R			65.0 ✓
" 135R			71.0 ✓

0+30 129R			71.0 ✓
0+30-123R			59.1 ✓
" -123R E Sand Bottom			49.1 ✓
" -100R = A+20			50.0 ✓
" 74R E.S.B.			51.2 ✓
" 74R		8.5	62.5 ✓
" - 90R		5.4	65.6 ✓
C-0+20	424	80.12	42.4 75.88 ✓
" - 36R			7.4 72.7 ✓
" - 17R		Ⓢ	16.0 64.1 ✓
C-0+30 00			12.8 67.3 ✓
0+30-25L			9.0 71.1 ✓
0+30-39L			10.5 80.6 ✓
0+40-58L		✓	0.0 80.1 ✓

148012

0+40-39L		4.0	76.1	✓
0+40-29L		8.4	71.7	✓
60+40-00		14.0	66.1	✓✓
0+40-14R		16.7	63.4	✓✓
0+40-35R		23.5	56.6	✓✓
0+60-100R = A0+60	5.60	54.8	49.2	
0+40-79R		3.2	51.6	✓
" - 87R		3.5	51.3	✓✓
A0+40		5.6	49.2	✓✓
" 117R E. Sand Bottom		6.0	48.8	✓✓
119R			66.8	✓✓
122R			69.8	✓✓
137R			72.8	✓✓
142R			77.8	✓✓
	54.8			
0+60-125R			76.8	✓✓
" 125R			68.8	✓✓
" 115R			57.8	✓✓
" 115R		4.0	50.8	✓✓
" 112R		6.0	48.8	✓✓
" 100R = A0+60		5.6	49.2	✓✓
" 85R		5.6	49.2	✓✓
" 78R		3.4	51.4	✓✓
" 69R	✓	3.4	51.4	✓✓

4/29/20

Sand sections cont.

19

C-0+60	00	634	634	✓
0+60-36R			85	54.9 ✓✓
" - 17R			50	58.4 ✓✓
0+60 C			00	63.4 ✓✓
C-0+60	11.5	749	634	✓
0+60-38L			34	71.5 ✓✓
" - 59L			17	73.2 ✓✓
D-0+60=80L	56	840		78.4 ✓✓
0+60-98L			60	84.0 ✓✓
0+80-105L			00	84.0 ✓✓
" 93L			4.5	79.5 ✓✓
" 92L			96	74.4 ✓✓
" 85L			11.9	72.1 ✓✓
0+80 D Line	56	76.7		71.1 ✓✓
" 39L			56	71.1 ✓✓
C-0+80	56	653		59.7 ✓
0+80-22L			00	65.3 ✓✓
" - 8L			19	63.4 ✓✓
G-0+80	00	59.7		59.7 ✓✓
0+80-16R			50	54.7 ✓✓
" - 29R			54	54.3 ✓✓
" - 34R		✓	69	52.8 ✓✓

1/29/20.

Sand sections cont.

20

0+80-52R.	597	84	51.3	✓✓
" 66R.		10.8	48.9	✓✓
A0+80-100R	56	546	49.0	✓✓
" 108R		5.8	48.8	✓✓
" 110R.		3.3	51.3	✓✓
" 110R Vert.			73.3	✓✓
<hr/>				
B Line H.I.	63.57			
1+00 113R		4.90	72.6	✓✓
1+00-107R.		1.0	62.6	✓✓
" - 96R.		4.6	59.0	✓✓
" 81R.		11.2	52.4	✓✓
" 79R E. Sand Bottom		14.9	48.7	✓✓
" 44R		15.0	48.6	✓✓
" 34R		11.5	52.1	✓✓
" 21R		9.1	54.5	✓✓
" 8R.		8.5	55.1	✓✓
1+00-G		6.5	57.1	✓✓
1+20-18L		5.6	58.0	✓✓
1+20-G.		9.4	54.2	✓✓
" 18R		14.1	49.5	✓✓
" 27R		15.2	48.4	✓✓
" 68R E.S.B.		14.7	48.9	✓✓
" 80R = B1+20		11.2	52.4	✓✓

1/29/20

Sand Sections

63.57

1720-91R	6.5	57.1	✓✓
" - 109R	1.8	61.8	✓
" - 112R	00	63.6	✓
" - 112R	+5.0	68.6	✓
" - 130R	+10.0	73.6	✓
<hr/>			
17394-118R	+10.0	73.6	✓
14394-114R Vert 7.5	+7.5	76.1	✓
" - 114R	00	63.6	✓
" - 98R	5.4	58.2	✓
" - 88R	6.5	57.1	✓✓
" - 80R = β Line	9.7	53.9	✓

C 1720 Top slate	8.50	63.25	54.75
14394			
" 71R	18.8	52.5	✓✓
" 50R	14.8	48.5	✓✓
" 20R	15.4	47.9	✓✓
" 17R	10.4	52.9	✓✓
" 16R	4.1	59.2	✓✓
" 1L	0.6	62.7	✓
" 4L	4.8	58.5	✓✓
" 30L	5.6	57.7	✓✓
" 42L	0.6	62.7	✓

21

1/29/20

Sand Sections

63.25

1460-55'L	12	62.1 V
" - 40'L	48	58.5 V
- 14'L	74	55.9 V
1460 C Line	139	49.4 V
" - 15'R	150	48.3 V
" - 40'R	149	48.4 V
" - 45'R	135	49.8 V
" - 51'R	135	49.8 V
" - 61'R	108	52.5 V
" 80'R - B. 1460	79	55.4 V
" 94'R	34	59.9 V
" 94'R	+2.6	65.9 V
" 94'R	(9)	71.9 V

1480 120R	+10-	73.3 V
1480-94R	00	63.3 V
1480-80' B.	65	56.8 V
1480-71R	93	54.0 V
1480-52R	108	52.5 V
" - 35'R	150	48.3 V
" - 15'R	153	48.0 V
" - 00 = C. 1480	137	49.6 V
" 15L	146	48.7 V
" - 25A	124	50.9 V

22

1/29/20

Sand sections

23

6.325

1480-36'L	7.3	56.0 VV
1480-42'L	6.8	56.5 VV
" - 54'L	4.3	59.0 VV
" - 63'L	1.3	62.0 VV
2400-58'L	9.0	54.3 VV
" - 41'L	14.2	49.1 VV
" - 25'L	14.1	49.2 VV
2400 - 0 line	14.6	48.7 VV
" - 6R	15.3	48.0 VV
" - 26R	15.4	47.9 VV
" - 34R	11.1	52.2 VV
" - 59R	9.7	53.6 VV
" - 73R	6.5	56.8 VV
" - 76R	1.8	61.5 VV
- 80R B	0.8	62.5 VV
" - 96R	+10.0	73.3 VV
2420-82R	+10.0	73.3 VV
2420-80R	+4.5	68.8 VV
2420-71R	+1.0	64.3 VV
2420-62R	6.5	56.8 VV
" - 48R	10.0	58.3 VV
" - 26R	10.5	52.8 VV

1/29/20

Storage

Sand Sections

6325

1	2+20-16R	15.6	47.7	VV
1	2+20 C	15.6	47.7	VV
	2+20-53L	15.7	47.6	VV
	2+20-74L	14.7	48.6	VV
2	2+20-80L	11.1	52.2	VV
		16.1		
	2+40-5 100'L	16.1	47.2	VV
	" - 84L	16.2	47.1	VV
	" - 31L	14.9	48.4	VV
	" - 31L 10.5 Vert	4.4	58.9	VV
	" - 14L Rock	25	60.8	VV
	" - 00-2+40C	10.5	52.8	VV
	" - 6R	13.5	49.8	VV
	" - 14R	12.8	50.5	VV
	" - 21R	10.3	53.0	VV
	" - 35R	10.0	53.3	VV
	" - 42R	7.0	56.3	VV
	" - 50R	6.5	56.8	VV
	" - 50R Vert 35	3.0	60.3	VV
	" - 54R	3.0	60.3	VV
	" - 54R Vert 85	45.5	68.8	VV
	" - 60R	110.0	73.3	VV

C-2+60

25

608

1/29/20

Sand Storage Sections

25

6325

2+60 E 100 L			15.3	48.0	VV
2+60-67 L			15.0	48.3	VV
" - 48 L			14.3	49.0	VV
" - 39 L TPHL	16.0	66.3	<u>13.0</u>	<u>50.3</u>	VV

" - 27 L			16.0	50.3	VV
" - 27 L			11.0	55.3	VV
" - 00 2+60 C			5.5	60.8	VV
" - 5 R.			16.0	50.3	VV
" - 15 R.			16.0	50.3	VV
" - 29 R.			11.0	55.3	VV
" - 37 R.			9.0	57.3	VV
" - 38 R.			8.0	58.3	VV
" - 46 R.			+7.0	73.3	VV

2+80-41 L Edge Sand.			14.8	51.5	VV
2+80-25 L			6.7	59.6	VV
" - 19 L			5.5	60.8	VV
" - 19 L Vert 15.7		Water Hole	21.2	45.1	VV
" - 3 R			6.5	59.8	VV
" - 13 R			3.0	63.3	VV
" - 18 R			1.0	65.3	VV
" - 42 R			+6.0	72.3	VV

4/29/20

Storage

Sand sections

3+00 E = 100 L	12.5	63.0		50.5 VV
3+00-76 L E Sand			11.8	51.2 VV
3+00-75 L			8.3	54.7 VV
" 64 L			7.0	56.0 VV
" 34 L	15.6	72.6	6.0	52.0 VV
" 15 L			2.0	70.6 VV
" 11 L			2.0	70.6 VV
" 4 L			7.0	65.6 VV
" 8 R			7.0	65.6 VV
" 18 R			0.0	72.6 VV
<hr/>				
3+20-100 L = E	15.8	71.9		56.1 VV
" - 68 L			13.5	58.4 VV
" - 58 L	5.6	72.4	5.1	66.8 VV
" - 40 L			3.0	69.4 VV
" - 40 L		(9)	7.0	65.4 VV
" - 32 L			7.0	65.4 VV
" - 25 L			0.0	72.4 VV

71.9

Sand Storage Sections

27

1400 D	5.6	76.1	70.5
1400-19L		10.8	65.3 ✓
1400-33L		6.5	69.6 ✓✓
" - 48L		5.0	71.1 ✓✓
" - 60L		6.0	70.1 ✓✓
" - 80L = D		5.6	70.5 ✓✓
" - 110L		4.6	71.5 ✓✓
" - 118L		0.0	76.1 ✓✓

1420 D	5.6	75.6	70.0
" 40L		8.5	67.1 ✓✓
" 63L		6.2	69.4 ✓✓
" 80L D. 1420		5.6	70.0 ✓✓
" 115L		5.6	70.0 ✓✓
" 134L		0.0	75.6 ✓✓

14394 E Line	7.9	76.8	68.9 ✓
" - 63L		8.8	68.0 ✓✓
14394-80L		7.9	68.9 ✓✓
" - 92L		7.3	69.5 ✓✓
" - 100L		7.9	68.9 ✓✓
" - 113L		7.6	69.2 ✓✓
" - 116L	(?)	1.0	75.8 ✓✓
" - 123L		4.3	72.5 ✓✓
" - 133L		0.0	76.8 ✓✓

1/29/20

Sand Sections
Storage

28

E Line TP Stamp 14.80 75.70 60.90

F Line

F 1+60 4.97 70.73

1+80 7.4 68.3

2+00 8.2 67.5

13.0 62.70

P Top 2+20 12.4 63.26

Sections

75.70

1+60 - 100L - E 9.9 65.8^W1+60 - 169 L 5.0 70.7^W1+60 - 200L = F 4.97 70.73^W" - 227 L 4.5 71.2^W" - 234 L 0.0 75.7^W1+80 - 100L - E 12.4 63.3^W1+80 - 143 L 9.4 66.3^W

1/29/30

Sand Storage Sections

29

7570

1780 - 177' L	8.3	67.4 ^{VV}
1780 - 200' L - F	7.4	68.3 ^{VV}
1780 - 227' L	3.8	71.9 ^{VV}
1780 - 241' L	00	75.7 ^{VV}
2100 - 257' L	00	75.7 ^{VV}
2100 - 211' L	7.7	68.0 ^{VV}
2100 - 200' L F	8.2	67.5 ^{VV}
2100 - 186' L	10.9	64.8 ^{VV}
2100 - 172' L	11.4	64.3 ^{VV}
2100 - 100' L	14.0	61.7 ^{VV}
2120 - 274' L	00	75.7 ^{VV}
" - 249' L	3.5	72.2 ^{VV}
2120 - 227' L	6.8	68.9 ^{VV}
" - 212' L	11.4	64.3 ^{VV}
2120 - 200' L F	13.0	62.7 ^{VV}
" - 190' L	13.3	62.4 ^{VV}
" - 155' L	18.8	61.9 ^{VV}
" - 135' L	15.0	60.7 ^{VV}
" - 100' L	20.8	54.9 ^{VV}

1/29/20

Sand Storage Sections

30

TP Top Stake 2+20 F	453	6779	6326
2+40 - 261	+50		728 VV
2+40 - 249	00		678 VV
2+40 - 222	40		638 VV
2+40 - 200 L-F	11.3		56.5 VV
2+40 - 177 L	11.6		56.2 VV
" - 100 L-F	20.5		47.3 VV

2-25-20

Bob
Fisher

Coord Point on Radial Lines

-38-40-42

Occupy B-38 - Sight B-28
for 7°-09.72 - Set.

ends of

B-36 22.79 1°-26'

B-34 2°-52'

B-32-219 4-17'

B-31 5°-01'

B-30 5°-44'

Turn 90° -

Set point 30.19 - which = 38-425'

Occupy B-40 - Sight B-28 for
8°-36' Turn 90° - Chamed 42.26
which = 40-413.53 - P.O.R

Occupy B-42 - Sight B-28 for
10°-02' - Turn 90° - Chamed
21.77 which = 42-434.02 - Nail in B
Chamed- 21.35 = 42-412.62 Hub-

2-28-20

Sub
Fisher

Coord Points on Radial Lines -

44-46-48

Occupy B 44 Sight B 28 for
11°-28' Turn 90° set point -
chained 41.3 which =
44-414.49

Occupy B-46 Sight B 28 for
12°-53' - Turn 90° set point
chained - 23.57 which = 46-432.22
Chained - 18.18 = 414.04

Occupy B-48: Sight B 28 for
14°-18' - Turn 90° - set point
chained 39.74 which = 48-416.05
Point on Derrick Anchor

Occupy 38-350 - Sight
at Curve for 9-0° - Turn 7°-10°
chained - 42.15 - Set intersect
points for 28-350

52

Occupy - C-28c Sight
C-50 for 15°-45' - Turn 90°
Put 2 Reference points - beyond
B Line - 5

Occupy Reference point
Sight C-28 - Put in -
38-350 - + 38-375 - 38-425 -
which will be used for x section
of Bottom -

2-26-20

Bob
Fisher

Coord Points 46-44-42-40-
Occupy 46-300 - Sight B-46-
chained - 25.5 = 46-325.5 (int)

Occupy 44-300 - Sight B-44-
chained 29.39 = 44-329.39

Occupy 42-300 Sight 42-
for 00 - chained 42.6 = 42-342.6

Occupy 40-300 - Sight 40-
for 00 chained 41.85 =
40-341.85

Points for Monthly Est
Feb-1920

Occupy B-36 - Sight B-25
for 5°-44' Turn 90° -
Chain = 65.79 - Set 36-390° -

Occupy 36-390 Sight Center
for 90° - -

Coord

38-390	19.496	10-26
40-390	38.984	2°-52'
42-390	58.446	4°-18'
44-390	77.870	5°-44'
46-390	97.246	7-10°

Occupy 44 -
Sight 44-250 - measured
31° toward center = 44-215 91

Coordinate Points

Occupy 42-434⁰² Sight
 42-412⁶⁷ for 0-00 - measured
 from 42-412⁶⁷ - ~~7.45~~ =

42-420¹² - Nail in Rock -

Ref Point + P.O.R. - about 42-624 ✓

Sight 42-250 for 0-0 -

Put Hub - measured 32.89

= 42-217¹¹ ✓

Occupy 40-413⁵³ ✓

Ref Point + P.O.R. about ⁴⁰674 -

Occupy 40-413⁵³ Sight
 40-250 for 0-0 - chained -

30.9 = 40-219¹² P.O.R.

Occupy B-38 Sight 38-250
 measured 24x62 = 38-480⁴¹

Sight 38-250 - Chain 20.46

Toward Center = 229.54 + P.O.R. ✓

Occupy B24 - Sight C24

Measured North 49.62 for

24 - 505.41 - Hub

Fisher 4/23/20

Mixer

Occupy B-22 - Sight C 22

Pro long line north - Chain
41.61 = 22-497.40

Occupy B 20 Sight C 20
chain toward center - 34.58
= 20-421.21

Chained North 49.10 set
Hub - = 504.89 - set
sight on tree about 5+40

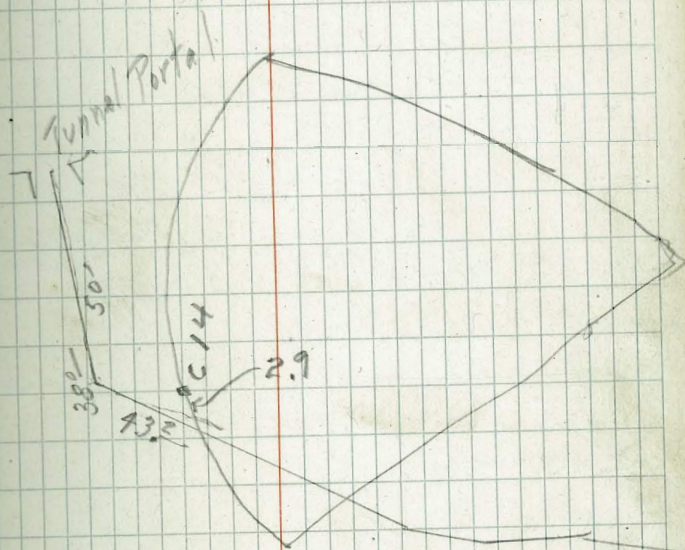
Occupy B 18 Sight
+ on Rock - North
set Hub - Chained 3221
= 18-485.00

Occupy 14 - 417.92 Sight
14 - 319 Measured North 18.36
for 14 - 436.28 set Nail in Rock
~~Set Nail about~~
set Nail 14 - 473

Occupy 12 - 437 Sight 12
315 - Measured toward
Center 10.68 for 12-426.00
Measured North set Nail 65.09
H = 12 - 502.09

Set RP. on Sewer Line Trestle {12-458.68}

Location of Out Let
Tunnel or Conduit



Cut of 46' from original Elevation
+ Top of Tunnel -

B. - 4/20

Sub
Fisher

38

Occupy C18 Sight Target
for 0-0 - Turn $20^{\circ}-03'-12''$
set intersection points

Occupy 46-250 - Sight 46-432-22

set intersection points -

which = C46 -

Occupy C46 - Sight
C18 for $20^{\circ}-03'-$

reflection

C46 00

+ P.O.R.

20'

C44 $1^{\circ}-26'$

Pop Tack

10

40 C42 $2^{\circ}-52'$

P.O.R.

10

40 C41 $3-35'$

10

60 C40 $4^{\circ}-18'$

C39 $5-01'$

80 C38 $5-44'$

6/4/10

~~90~~ 37 6-27100 C36 7-10

130 C33 9-19

140 C32 10-02 ✓

150 C31 10-45 ✓

160 C30 11-28 ✓

170 C29 12-11

180 C28 12-54 ✓

190 C27 13-36

200 C26

210 25

220 24

230 23

240 20

250 19

4/20
Rab
Fisher
Myster

Elev. for Up stream Face
of Dam.

40

B-38	3.35	1473.65	1470.30	
TP on Rock	0.86	58.68	1583	57.82
		" "		
C-33-		12.2	465	out 11.9
C-32	47.6	12.4	463	out 11.9
C-31		4.9	538	nl. 11.1
C-30		0.3	584	out 10.7
C-29			640	nl. 10.1
C-36		9.1	49.6	out 11.5
TP	9.11	66.93	5782	
C-37		14.4	58.5	out 11.2
		10.0	57.	nl 10.8
		8.9	59.0	59.10.7

4/9/20
Fisher
Mixer

Stakes - Down + Upstream
Face for Markers -

41

	Elev.	Down Distout	Up/Pr Distout		Dist out
6-	1595	20.0	0.0		
10	1575	31	0.0	1579.30	
12	1565	41	0.0	1565.1	
14	1556	48	1.0	1553.0 -	1.2
16	1543	58	2.5	1546.0	1.9
18				1534.2	3.1
70					
68					
66					
64	1587	25.6	0.0	1581.7	1.0
62	1578	31.7	0.0	1573.2	0.0
60	1568.0	40.0	0.1	1564.05	0.1
58	1560	45.0	1.0	1554.0	1.1
56	1552.5	50.4	3.0	1545 -	2.0
54	1546	56.6		1534.2	3.1
52	1533	65.8 ✓	3.90	1526.2	3.9
50	1533				
	1526	71.0	4.20		
			4.90		

6/10/20

Fisher
Mixer

Coordinate Points -

Occupy B-20 Sight B50
for $21^{\circ}-29'$ - Turn $90^{\circ}-0+$
check Center - Chained.
49.21 - North Set - 20-505
Chained toward Center 34.58
Set Hub = 421.21 ✓

Occupy B18 - Chained
North - 32.21 Set
18 - 488
Turned 90° - Put. 14+
12 - 455.79 by Intersection
Pipe Line at 16 -

Set Hub 16 - 464.40
Chained - 25.65 North
490.99

Occupy - 14 - 455.79
Chained North 39.31 =
14 - 495.10 495.10

Occupy B-22 Chained
46.55 - Toward Center -
22 - 409.24 -

Occupy B 24 - Chained
49.21 North set Hub 24 - 505.79

Occupy C 16 -
Measured 66.19 Toward Center
+ on Rock - 16 - 333.90 ✓

Occupy C 12 - Chained
59.87 Toward Center -
12 - 340.13 ✓

4/21/20
Fisher
Mixer
BM near
B-30

El- Bottom Excav

TP on Rock

8.00 1479.73 1471.73

1.12 65.08 15.77 63.96

TP

1.38 51.98 14.38 50.10

2.0 42.4 15.61 36.37

El- Bottom

12.8 29.6

B.M. for El of Bottom

4.2 38.2

6/2
Fisher
Mixer

Chained from C18 to C8
99.95 which did not check by
.15 - Occupied C8 - Sight
C18 - Turn 90° - + do not
check tack by .02 - Occupied
C12-3 + sight 12-50
+ check tack C-12

44

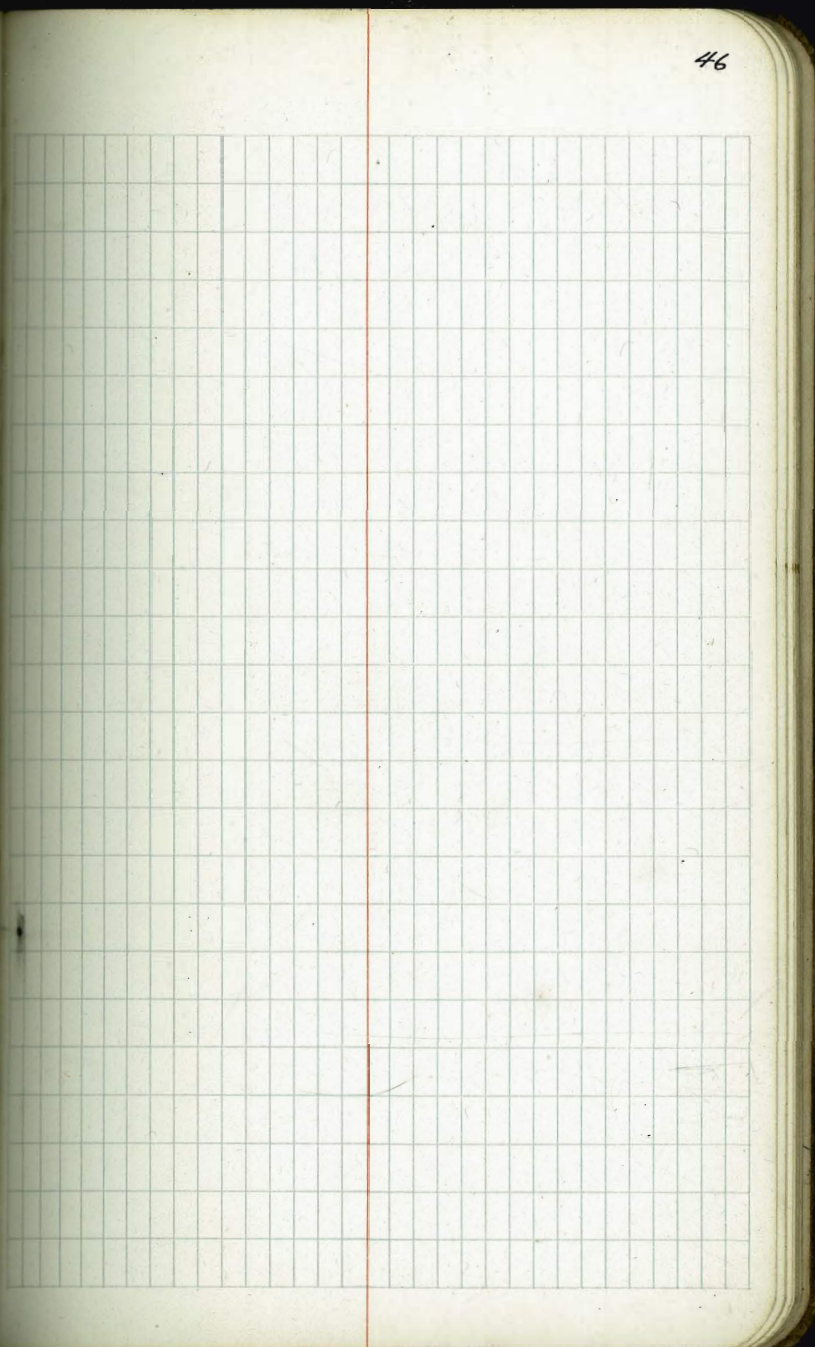
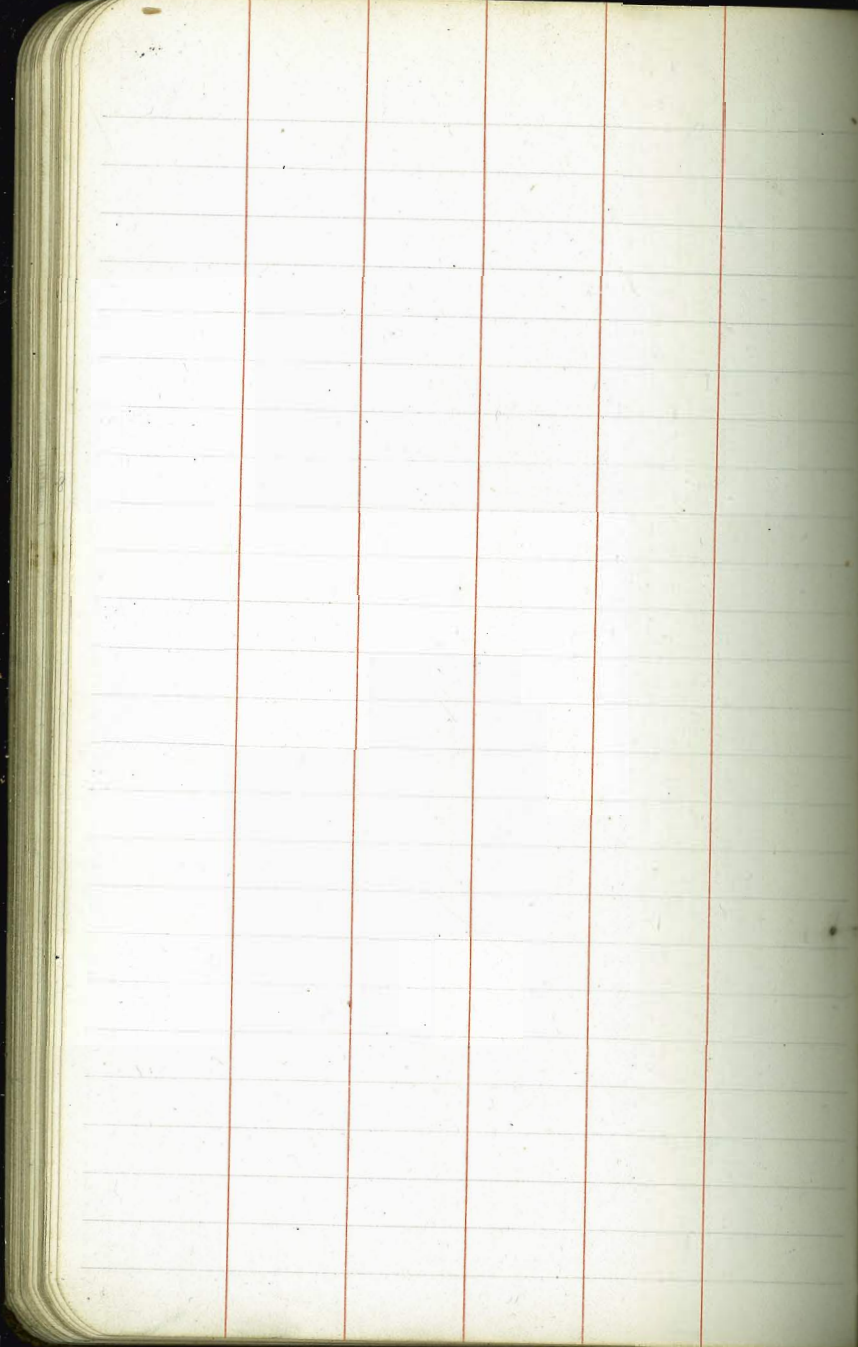
10/5/20

Fisher
Mixer

Occuppy 18-488- Sight C 18
Measured 17.25 = 18-470 ~~25~~
Nail in Rock.

Measured North 14.17 =
18-502 17 -

Occuppy 52-468'' Sight
RP. East Turn 90° - Chaw
20 + set 59-468''

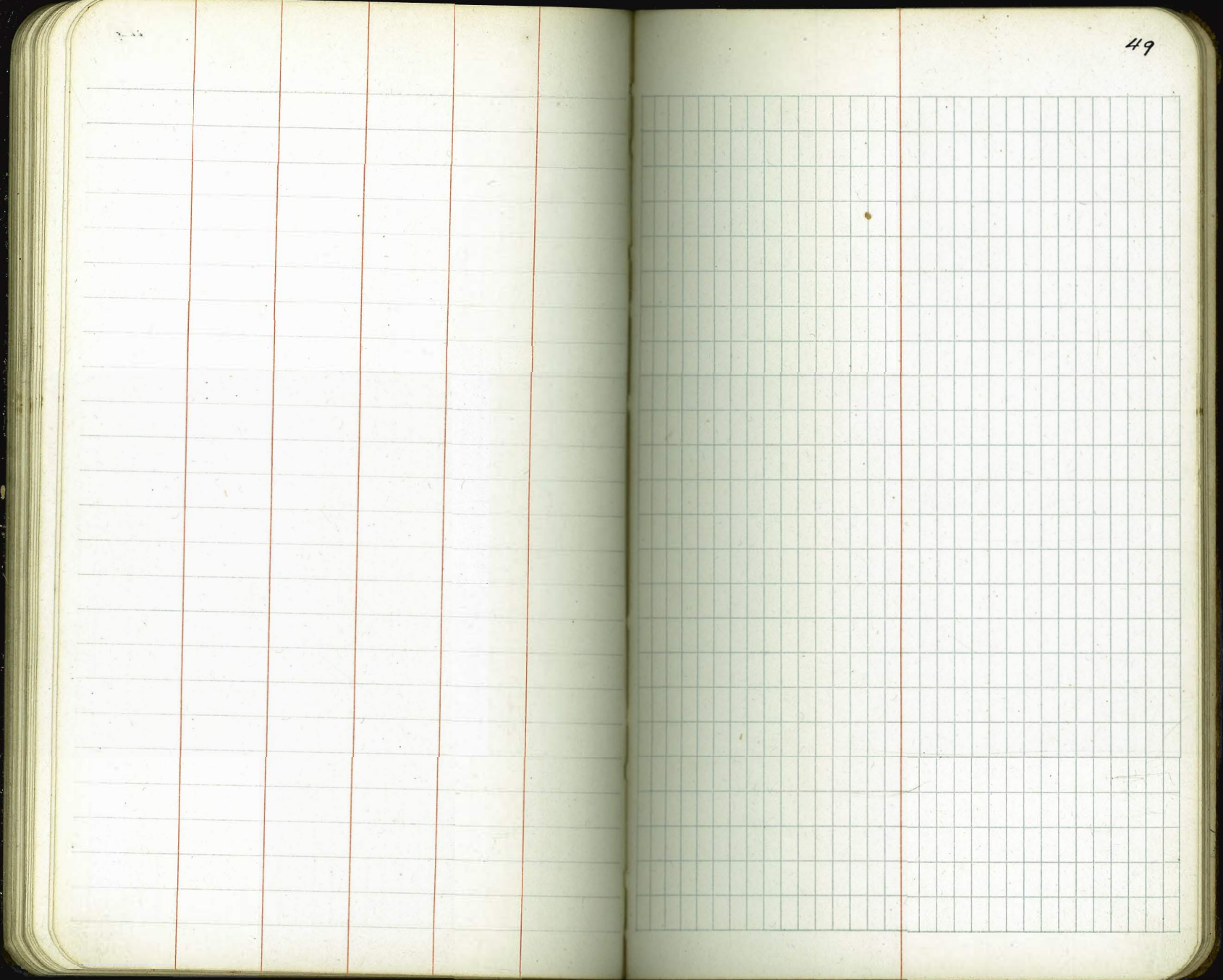


This page is a ledger-style sheet with horizontal ruling and four vertical red lines. The lines divide the page into five columns of varying widths. The columns are approximately 15%, 20%, 20%, 20%, and 25% of the page width from left to right. The page is otherwise blank.

This page is a ledger-style sheet with horizontal ruling and a single vertical red line. The red line is positioned approximately one-third of the way from the left edge. The area to the right of the red line is filled with a fine grid of small squares, typical of graph paper. The page is otherwise blank.

This page is a blank ledger page. It features horizontal ruling lines spaced evenly down the page. There are four vertical red lines that create five columns of varying widths. The columns are roughly in the proportions of 1:1:1:1:2 from left to right. The page is otherwise empty of any text or markings.

This page is a blank ledger page with a grid pattern. It features a grid of small squares, approximately 20 columns wide and 25 rows high. A single vertical red line is positioned on the right side of the page, roughly one-fifth of the way from the right edge, creating a narrow margin. The page is otherwise empty of any text or markings.

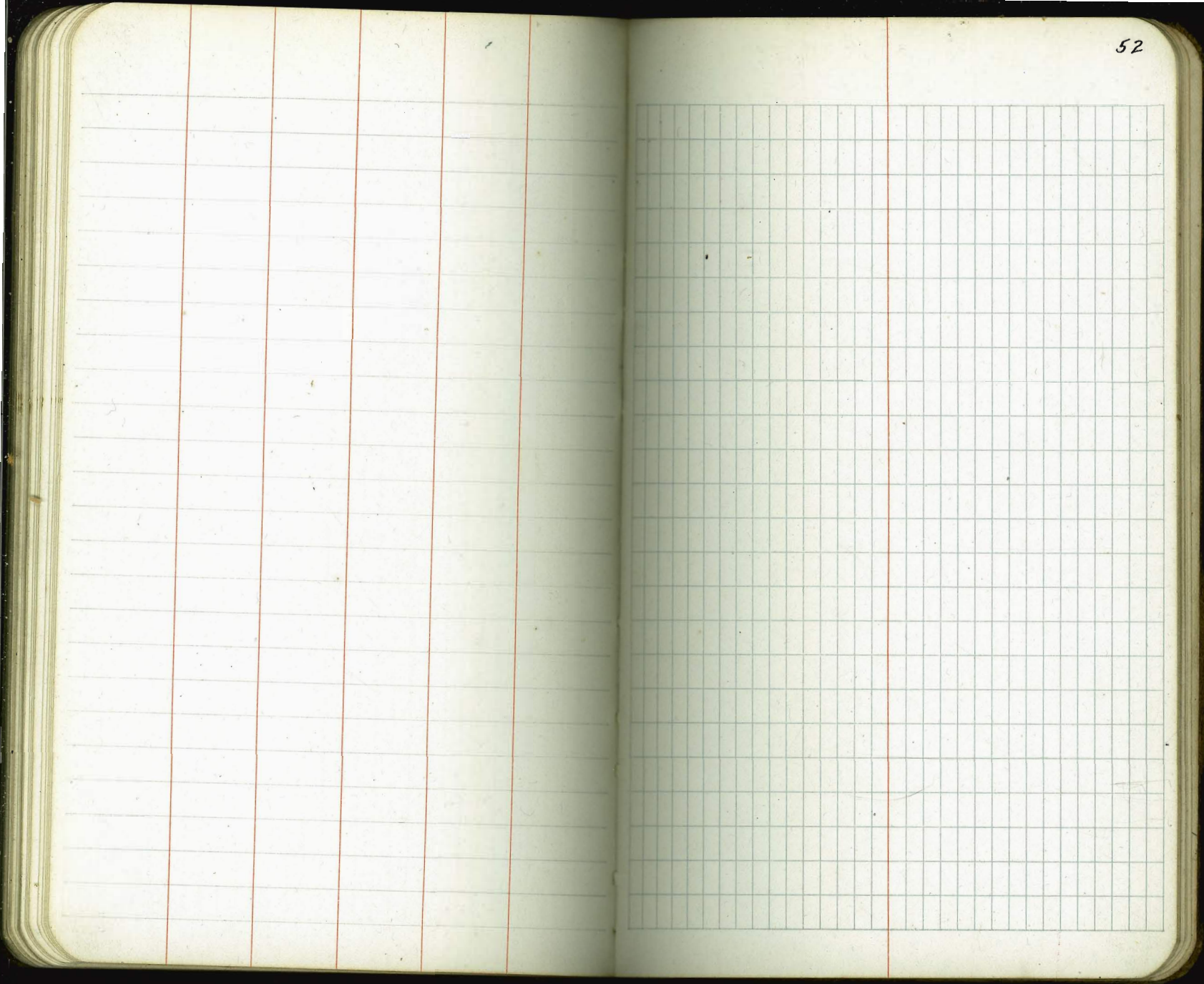


This page is a blank ledger page. It features horizontal ruling lines spaced evenly down the page. There are four vertical red lines that create five columns of varying widths. The leftmost column is the narrowest, followed by a wider column, and then two more columns of similar width on the right side. The page is otherwise empty of any text or markings.

This page is a blank ledger page with a grid pattern. It features a vertical red margin line on the left side, creating a narrow left margin. The rest of the page is filled with a grid of small squares, typical of graph paper or a detailed ledger. The grid consists of approximately 20 columns and 25 rows. The page is otherwise empty of any text or markings.

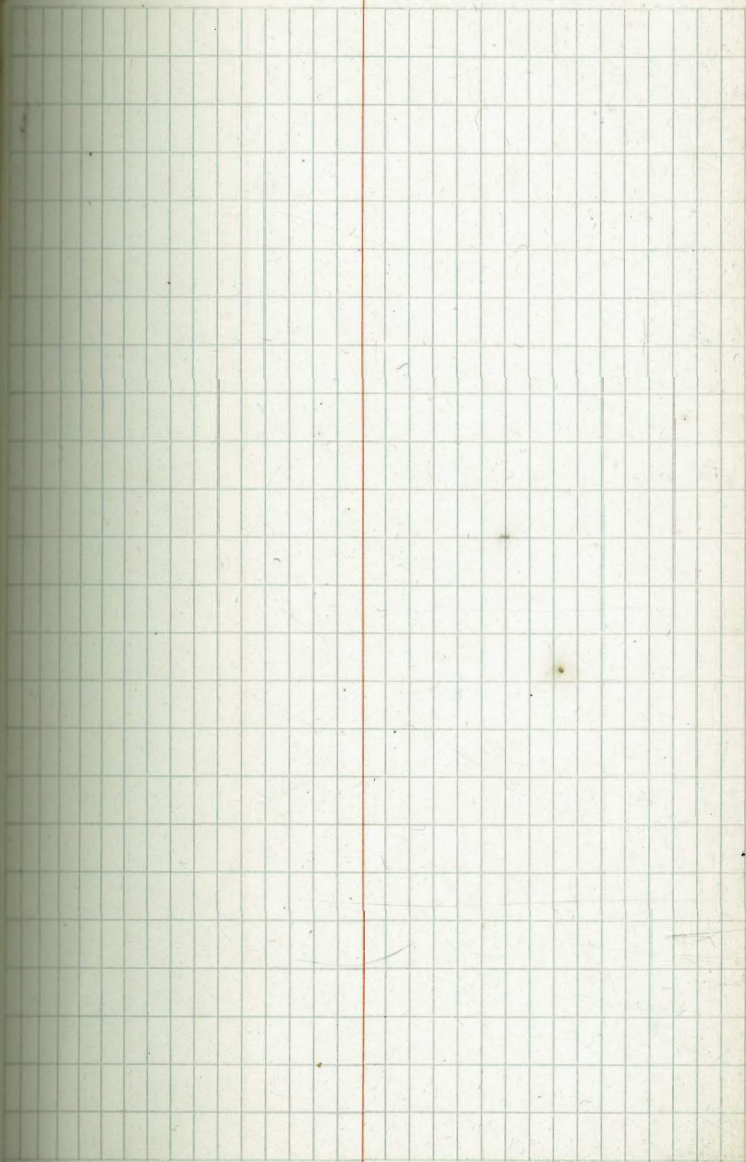
This page features horizontal blue ruling lines spaced evenly down the page. It is divided into four vertical columns by three red margin lines. The columns are of varying widths, with the two inner columns being the narrowest and the two outer columns being wider. The page is otherwise blank.

This page contains a grid of small squares, typical of graph paper. The grid is composed of light blue lines. A single vertical red margin line is positioned on the left side of the grid, creating a narrow left margin. The grid covers most of the page area.



This page features horizontal ruling lines spaced evenly down the page. It is divided into four vertical columns by four red margin lines. The columns are of varying widths, with the two inner columns being the narrowest and the two outer columns being the widest. The page is otherwise blank.

This page features a grid pattern of small squares. A single vertical red margin line is positioned on the left side of the page, creating a narrow left margin. The rest of the page is filled with the grid pattern. The page is otherwise blank.





Cableway Line Elevations

West

East-

0+00	0-4466		0+00	
0-4466	0+0	1631.70	50-3003	1524.51
1+5	1+75	1707.05	1+0	1561.51
2+0	2+00	1715.89	2+0	1618.81
	2+50	1739.25	2+38.43	1649.52
	3+00	1760.48	3+00	1685.42
			3+29.27	1704.52
			3+76.33	1739.82
			4+25	1766.43

"P" Line Elevations

Radius 00-301 = 0+10 on "P" line
 Sight. 15+25 - Quarry Road for 0-0

0+10-	1618 <u>65</u>
0-301-	
0+32	1627 <u>85</u>
0+89.08	1650 <u>0</u>
2+00	1686 <u>21</u>
2+60	1713 <u>72</u>
3+00	1731 <u>26</u>
3+26.7 15+25-Road	1742 <u>24</u>
B.M.	1751 <u>67</u>

"C" Line Elevations.

		40	1478 <u>19</u>
		42	1490 <u>13</u>
		44	1497 <u>69</u>
8	1581 <u>00</u>	46	1505 <u>59</u>
10	1574 <u>30</u>	48	1516 <u>75</u>
12	1565 <u>12</u>	49	1522 <u>70</u>
14	1582 <u>90</u>	52	1526 <u>16</u>
16	1546 <u>14</u>	54	1534 <u>24</u>
18	1514 <u>61</u>	56	1544 <u>97</u>
19	1536 <u>11</u>	58	1553 <u>97</u>
20	1529 <u>37</u>	60	1564 <u>05</u>
22	1522 <u>67</u>	62	1573 <u>18</u>
22	1515 <u>86</u>	64	1581 <u>76</u>
23	1507 <u>16</u>	66	1591 <u>76</u>
24	1502 <u>02</u>	68	1602 <u>39</u>
25	1496 <u>39</u>	70	1613 <u>53</u>
26	1483 <u>08</u>	72	1624 <u>63</u>
27	1426 <u>13</u>	7+33 <u>69</u>	1630 <u>59</u>
28	1479 <u>69</u>	74	1635 <u>20</u>
29	1471 <u>46</u>	B.M. + 160	1649 <u>84</u>
36	1466 <u>56</u>		
38	1470 <u>41</u>		

54
 6.5
 57
 40.5
 25
 40

"B" Line Elevations

		54	1545 ²⁰
		56	1550 ³⁴
		58	1559 ⁵³
14	1578 ⁶²	60	1568 ⁴¹
16	1568 ⁷⁶	62	1579 ⁴³
18	1557 ⁸¹	64	1588 ⁶⁴
20	1545 ¹¹	66	1603 ⁵⁶
22	1534 ⁷³	68	1617 ⁴⁸
24	1525 ²⁰	70	1624 ⁰³
26	1503 ⁸⁵		
28	1488 ⁴⁵	74	1650 ⁴⁴
30	1472 ³⁵		
32	1466¹⁰		
34	1466 ⁹⁴		
36	1470 ³⁰		
38	1473⁸⁵		
40	1473 ⁸⁵		
42	1480 ⁶⁴		
44	1490 ⁴¹		
46	1502 ⁶⁸		
48	1512 ⁷⁸		
50	1522 ⁶⁷		
52	1532 ⁸⁹		

R 250 ElevationsR275 Elevations

Radius 300 Elevations

R-325' Elevations

Miss

34
 36 1467 30
 38 1474 28
 40 1480 30
 42 1488 29
 44 1496 84
 46 1507 33
 48 1516 37
 50 1524 46
 52
 54
 56
 58
 60

00-300 1626 16
 8-429 1630 56 34-274 14 1467 04
 4-300 1603 23
 4-455 1615 92
 6-480 1615 35
 8-450 1601 85
 10-315 1573 77
 10-442 1596 58
 12-318 1561 72
 12-427 1588 34
 14-319 1551 84
 14-350 42 1556 70
 4-179 4
~~4-442~~ 1574 98 ✓
 6-309 1539 58
 6-446 02 1567 78
 18-303 1529 40
 20-312 1515 59
 22-321 32 1511 09
 24-321 3 1502 77
 26-366 1491 72
 27-357 1479 60 ✓
 Top of Wall 1467 41

- B.M. -

Harris BM W.S. & S.	Iron pin set in top of 13' outfall 60' south old Blacksmith Shop	1626.35
Top of Wall	1467.41	
Nail in Stump	C-52-C54-15' North	1534.73
Hub about	C. 7160 with witness	1649.80
Nail in Rock	30' N-3+00 West cable way	1764.32
On Old Engine Base	N side Canyon	1461.38
Nail in 2x8	North Side Tunnel P Line	1650.97
Nail in Stump	10-340	1579.55
Nail - Top concrete	Joint End Iron pipe about 10-447	1597.75
Nail in Stump	about 12-330	1570.85
Nail in Stump	about 16-465	1573.90
Nail in Stump	about 17-410	1559.96
Nail in Rock	4' West-SW cor. Concrete Tower 1	1546.24
Nail in Rock	24-432	1525.75
Nail in Stump	near B-30	1471.73
On Rock	52' S L	

KEITH'S RAILROAD CURVE TABLES.

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HOW TO USE KEITH'S TABLES.

EXAMPLE.

Wanted a Curve with an Ext. of about 12 ft. Angle
of Intersection or I. P. = $23^{\circ} 20'$ to the R. at Station
542+72.

Ext. in Tab. IV opposite $23^{\circ} 20' = 120.87$
 $120.87 \div 12 = 10.07$. Say a 10° Curve.

Tan. in Tab. IV opp. $23^{\circ} 20' = 1183.1$
 $1183.1 \div 10 = 118.31$.

Tab. V correction for A. $23^{\circ} 20'$ for a 10° Cur. = 0.16
 $118.31 + 0.16 = 118.47 =$ corrected Tangent.

(If corrected Ext. is required find in same way)
Ang. $23^{\circ} 20' = 23.33^{\circ} \div 10 = 2.3333 =$ L. C.

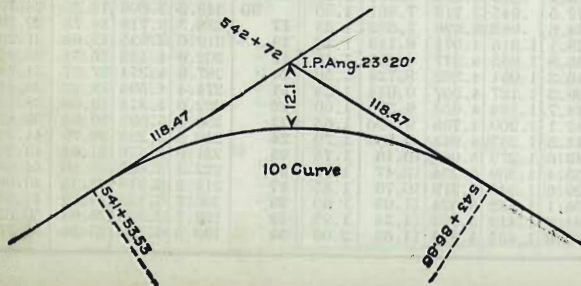
$2^{\circ} 19\frac{1}{2}' =$ def. for sta.	542	I. P. = sta.	542+72
$4^{\circ} 49\frac{1}{2}' =$ " " "	+50	Tan. =	1.18.47
$7^{\circ} 19\frac{1}{2}' =$ " " "	543	B. C. = sta.	541+53.53
$9^{\circ} 49\frac{1}{2}' =$ " " "	+50	L. C. =	2.33.33
$11^{\circ} 40' =$ " " "	543+	E. C. = Sta.	543+86.86
	86.86		

$100 - 53.53 = 46.47 \times 3' =$ (def. for 1 ft. of 10° Cur.) = 139.41' =
 $2^{\circ} 19\frac{1}{2}' =$ def. for sta. 542.

Def. for 50 ft. = $2^{\circ} 30'$ for a 10° Curve.

Def. for 36.86 ft. = $1^{\circ} 50\frac{1}{2}'$ for a 10° Curve.

(These tables are published in Field Books of
KEUFFEL & ESSER CO., New York, N. Y.)



22 55

R 17189

At 18-45 - sight C.H.
Dist 1725 - = 18-470, 705
Water Rock

Measured North - 14.12 =

18-502' 7

Water Rock

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 14 FEET WIDE. SIDE SLOPES 1½ TO 1.

FOR SINGLE TRACK EMBANKMENT.

	0	1	2	3	4	5	6	7	8	9	
0	7.0	7.2	7.3	7.5	7.6	7.8	7.9	8.1	8.2	8.4	0
1	8.5	8.7	8.8	9.0	9.1	9.3	9.4	9.6	9.7	9.9	1
2	10.0	10.2	10.3	10.5	10.6	10.8	10.9	11.1	11.2	11.4	2
3	11.5	11.7	11.8	12.0	12.1	12.3	12.4	12.6	12.7	12.9	3
4	13.0	13.2	13.3	13.5	13.6	13.8	13.9	14.1	14.2	14.4	4
5	14.5	14.7	14.8	15.0	15.1	15.3	15.4	15.6	15.7	15.9	5
6	16.0	16.2	16.3	16.5	16.6	16.8	16.9	17.1	17.2	17.4	6
7	17.5	17.7	17.8	18.0	18.1	18.3	18.4	18.6	18.7	18.9	7
8	19.0	19.2	19.3	19.5	19.6	19.8	19.9	20.1	20.2	20.4	8
9	20.5	20.7	20.8	21.0	21.1	21.3	21.4	21.6	21.7	21.9	9
10	22.0	22.2	22.3	22.5	22.6	22.8	22.9	23.1	23.2	23.4	10
11	23.5	23.7	23.8	24.0	24.1	24.3	24.4	24.6	24.7	24.9	11
12	25.0	25.2	25.3	25.5	25.6	25.8	25.9	26.1	26.2	26.4	12
13	26.5	26.7	26.8	27.0	27.1	27.3	27.4	27.6	27.7	27.9	13
14	28.0	28.2	28.3	28.5	28.6	28.8	28.9	29.1	29.2	29.4	14
15	29.5	29.7	29.8	30.0	30.1	30.3	30.4	30.6	30.7	30.9	15
16	31.0	31.2	31.3	31.5	31.6	31.8	31.9	32.1	32.2	32.4	16
17	32.5	32.7	32.8	33.0	33.1	33.3	33.4	33.6	33.7	33.9	17
18	34.0	34.2	34.3	34.5	34.6	34.8	34.9	35.1	35.2	35.4	18
19	35.5	35.7	35.8	36.0	36.1	36.3	36.4	36.6	36.7	36.9	19
20	37.0	37.2	37.3	37.5	37.6	37.8	37.9	38.1	38.2	38.4	20
21	38.5	38.7	38.8	39.0	39.1	39.3	39.4	39.6	39.7	39.9	21
22	40.0	40.2	40.3	40.5	40.6	40.8	40.9	41.1	41.2	41.4	22
23	41.5	41.7	41.8	42.0	42.1	42.3	42.4	42.6	42.7	42.9	23
24	43.0	43.2	43.3	43.5	43.6	43.8	43.9	44.1	44.2	44.4	24
25	44.5	44.7	44.8	45.0	45.1	45.3	45.4	45.6	45.7	45.9	25
26	46.0	46.2	46.3	46.5	46.6	46.8	46.9	47.1	47.2	47.4	26
27	47.5	47.7	47.8	48.0	48.1	48.3	48.4	48.6	48.7	48.9	27
28	49.0	49.2	49.3	49.5	49.6	49.8	49.9	50.1	50.2	50.4	28
29	50.5	50.7	50.8	51.0	51.1	51.3	51.4	51.6	51.7	51.9	29
30	52.0	52.2	52.3	52.5	52.6	52.8	52.9	53.1	53.2	53.4	30
31	53.5	53.7	53.8	54.0	54.1	54.3	54.4	54.6	54.7	54.9	31
32	55.0	55.2	55.3	55.5	55.6	55.8	55.9	56.1	56.2	56.4	32
33	56.5	56.7	56.8	57.0	57.1	57.3	57.4	57.6	57.7	57.9	33
34	58.0	58.2	58.3	58.5	58.6	58.8	58.9	59.1	59.2	59.4	34
35	59.5	59.7	59.8	60.0	60.1	60.3	60.4	60.6	60.7	60.9	35
36	61.0	61.2	61.3	61.5	61.6	61.8	61.9	62.1	62.2	62.4	36

Calculated by Julien A. Hall, M. Am. Soc. C. E.

134
70
64
K 5
325
0-1
100
270
15724
572
400
228.64
171.36

10-200